

Claims

1. An authoring method for use in creating an audiovisual
5 product or content, comprising the steps of:

defining a plurality of components (*icons
representing video data to be merged*), the components
implicitly representing functional sections of audiovisual
content (*first and second video data*) with respect to one
10 or more raw content objects (*VTSS from which the
audiovisual content is derivable*), and a plurality of
transitions that represent movements between the plurality
of components (*links that allow access to VTSS from VMG to
whichever of the first and second video data is being*
15 *merged into the other*);

processing the plurality of components and the
plurality of transitions to provide at least an
intermediate data structure of nodes and links, where each
node is associated with one or more of the raw content
20 objects and the links represent movement from one node to
another; and

creating an audiovisual product or content in a
predetermined output format, using the raw content objects
and the intermediate data structure of the nodes and the
25 links.

2. An authoring method as claimed in claim 1, in which the
step of processing comprises the step of producing an
explicitly realised set of AV assets and respective
nodes and links within the intermediate data structure

in response to assessing the type of the one or more raw content objects.

3. An authoring method as claimed in either of claims 1 and 2 in which at least one node associated with one or more raw content objects comprises a reference to the one or more raw content objects.

4. An authoring method for use in creating an audiovisual product, comprising the steps of: defining a plurality of components, the components implicitly representing functional sections of audiovisual content with respect to one or more raw content objects, and a plurality of transitions that represent movements between the plurality of components;

expanding the plurality of components and the plurality of transitions to provide a set of explicitly realised AV assets and an expanded intermediate data structure of nodes and links, where each node is associated with an AV asset of the set and the links represent movement from one node to another and where at least one of the nodes being associated with reference to a predetermined raw content object (*imported VTSSs*); and

creating an audiovisual product or content in a predetermined output format, using the AV assets, the expanded intermediate data structure of the nodes and the links, and the predetermined raw content object.

5. An authoring method for use in creating an audiovisual product or content, comprising the steps of: defining a plurality of components, the components implicitly representing functional sections of audiovisual content with respect to one or more raw content objects,

and a plurality of transitions that represent movements between the plurality of components; expanding the plurality of components and the plurality of transitions to provide a set of explicitly realised AV assets and an
5 expanded intermediate data structure of nodes and links, where each node is associated with an AV asset of the set and the links represent movement from one node to another; and creating a first portion of audiovisual product in a predetermined output format, using the AV assets and the
10 expanded intermediate data structure of the nodes and the links, and creating a second portion of the audiovisual product using a predetermined one of the raw content objects (*imported VTS*).6. An authoring method for use in creating an audiovisual product or content, comprising
15 the steps of:

defining a plurality of components, the components implicitly representing functional sections of audiovisual content with respect to one or more raw content objects, and a plurality of transitions that represent movements
20 between the plurality of components;

expanding the plurality of components and the plurality of transitions to provide a set of explicitly realised AV assets and an expanded intermediate data
25 structure of nodes and links, where each node is associated with an AV asset of the set and the links represent movement from one node to another; and

creating an audiovisual product or content in a
30 predetermined output format, using the AV assets and the expanded intermediate data structure of the nodes and the links, wherein the audiovisual product comprises data representing merged first and second video data.

7. The method of any preceding claim, wherein the defining step comprises defining at least one information component that comprises a reference to a raw content
5 object.

8. The method of claim 7, wherein the reference denotes a file path to a location where the raw content object is stored.

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9. The method of any preceding claim, wherein the defining step comprises defining at least one choice component comprising a reference to at least one raw content object, and at least one authoring parameter.

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10. The method of claim 9, wherein the at least one authoring parameter is adapted to control a selection or modification of the at least one raw content object.

20 11. The method of claim 9 or 10, wherein the at least one authoring parameter comprises a runtime variable available during playback of the audiovisual product.

12. The method of claim 9, 10 or 11, wherein the at
25 least one authoring parameter comprises an authoring-only parameter that will not be available during playback of the audiovisual product.

13. The method of any of claims 9 to 12, wherein the
30 choice component comprises a reference to a presentation template and a reference to at least one substitutable raw content object to be placed in the template according to the at least one authoring parameter.

14. The method of any preceding claim, wherein the defining step comprises defining at least one meta-component representing a set of components and
5 transitions.

15. The method of claim 14, wherein the at least one meta-component is a procedurally defined representation of the set of components and transitions.

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16. The method of any preceding claim, wherein each transition represents a permissible movement from one component to another component.

15 17. The method of any preceding claim, wherein each transition is associated with a triggering event.

18. The method of claim 17, wherein the triggering event is an event occurring during playback of the
20 audiovisual product.

19. The method of claim 18, wherein the triggering event is receiving a user command, or expiry of a timer.

25 20. The method of any preceding claim, further comprising the step of checking expected conformance of the audiovisual product with the predetermined output format, using the plurality of components and the plurality of transitions.

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21. The method of claim 20, wherein the predetermined output format is a hierarchical data structure having limitations on a number of objects that

may exist in the data structure at each level of the hierarchy, and the checking step comprises predicting an expected number of objects at a level and comparing the expected number with the limitations of the hierarchical data structure.

22. The method of claim 20 or 21, wherein the checking step comprises predicting an expected total size of the audiovisual product, and comparing the expected total size against a storage capacity of a predetermined storage medium.

23. The method of any preceding claim, wherein the expanding step comprises, for each component, building one or more of the set of explicitly realised AV assets by reading and manipulating the one or more raw content objects.

24. The method of any preceding claim, wherein:
the defining step comprises defining at least one choice component comprising a reference to a plurality of raw content objects and at least one authoring parameter; and

the building step comprises:

selecting one or more raw content objects from amongst the plurality of raw content objects using the at least one authoring parameter; and

combining the selected raw content objects to form one of the AV assets.

25. The method of claim 24, comprising repeating the selecting and combining steps to automatically build a plurality of the explicitly realised AV assets from the one of the components.

26. The method of any preceding claim, wherein the expanding step comprises:

10 creating from each one of the plurality of components one or more explicitly realised AV assets to provide the set of AV assets;

creating the expanded intermediate data structure
15 wherein each node represents one AV asset of the set; and

creating a set of links between the nodes.

27. The method of any preceding claim, wherein each transition is associated between first and second components, and creating the set of links comprises evaluating each transition to create one or more links, each of the links being between a node created from the first component and a node created from the second component.

28. The method of any preceding claim, wherein the expanding step comprises evaluating at least one of the transitions to create exit logic associated with at least one first node, evaluating one of the components to create entry logic associated with at least one second node, and providing a link between the first and second nodes according to the entry logic and the exit logic.

29. The method of claim 28, wherein at least one of the transitions is associated with a triggering event, and the expanding step comprises evaluating the triggering
5 event to determine the exit logic associated with the at least first one node.

30. The method of any preceding claim, further comprising the step of checking expected conformance of
10 the audiovisual product with the predetermined output format, using the AV assets and the expanded intermediate data structure of nodes and links.

31. The method of claim 30, wherein the
15 predetermined output format is a hierarchical data structure having limitations on a number of objects that may exist in the data structure at each level of the hierarchy, and the checking step comprises predicting an expected number of objects at a level and comparing the
20 expected number with the limitations of the hierarchical data structure.

32. The method of claim 31, wherein the checking step comprises predicting an expected total size of the
25 audiovisual product, and comparing the expected total size against a storage capacity of a predetermined storage medium.

33. The method of any preceding claim, wherein the
30 AV assets have a data format specified according to the predetermined output format.

34. The method of any preceding claim, wherein the AV assets each have a data format according to the predetermined output format, whilst the raw content objects are not limited to a data format of the predetermined output format.

35. The method of any preceding claim, wherein the predetermined output format is a DVD-video specification.

36. The method of any preceding claim, wherein the AV assets each comprise a video object, zero or more audio objects, and zero or more sub-picture objects.

37. The method of any preceding claim, wherein the AV assets each comprise at least one video object, zero to eight audio objects, and zero to thirty-two sub-picture objects, according to the DVD-video specification.

38. The method of any preceding claim, wherein the creating step comprises creating objects in a hierarchical data structure defined by the predetermined output format with objects at levels of the data structure, according to the intermediate data structure of nodes and links, and where the objects in the hierarchical data structure include objects derived from the explicitly realised AV assets.

39. The method of any preceding claim, wherein the predetermined output format is a DVD-video specification and the creating step comprises creating DVD-video structure locations from the nodes of the expanded intermediate data structure, placing the explicitly realised AV assets at the created structure locations, and

substituting the links of the expanded intermediate data structure with explicit references to the DVD-video structure locations.

- 5 40. An authoring method for use in creating a DVD-video product, comprising the steps of:

 creating a plurality of components representing
 parameterised sections of audiovisual content, and a
10 plurality of transitions representing movements between
 components;

 expanding the plurality of components and the
 plurality of transitions to provide a set of AV assets and
15 an expanded data structure of nodes and links, where each
 node is associated with an AV asset of the set and the
 links represent movement from one node to another; and

 creating a DVD-video format data structure from the
20 AV assets, using the nodes and links, wherein the DVD-
 video format data structure comprises data representing
 merged first and second video data.

41. The method of claim 39 or 40, comprising
25 creating at least one information component comprising a
 reference to an item of AV content.

42. The method of claim 40, comprising creating at
 least one choice component comprising a reference to at
30 least one item of AV content, and at least one parameter
 for modifying the item of AV content.

43. The method of claim 42, wherein the choice component comprises a reference to a presentation template and a reference to at least one item of substitutable content to be placed in the template according to the at
5 least one parameter.

44. The method of claim 42 or 43, wherein the choice component comprises at least one runtime variable available during playback of an audiovisual product in a
10 DVD player, and at least one authoring parameter not available during playback.

45. The method of any of claims 40 to 44, comprising creating at least one meta-component representing a set of
15 components and transitions.

46. The method of any of claims 40 to 45, wherein each transition represents a permissible movement from one component to another component, each transition being
20 associated with a triggering event.

47. The method of claim 46, wherein a triggering event includes receiving a user command, or expiry of a timer.
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48. The method of any of claims 40 to 47, wherein the expanding step comprises:

creating from each one of the plurality of components
30 one or more AV assets to provide the set of AV assets;

creating the expanded data structure wherein each node represents one AV asset of the set; and

creating a set of links between the nodes.

49. The method of claim 42 or any claim dependent
5 thereon, wherein the expanding step comprises evaluating
each choice component to create a plurality of AV assets
according to each value of the at least one parameter.

50. The method of claim 49, wherein evaluating each
10 choice component comprises creating entry logic associated
with at least one node and/or evaluating at least one
transition to create exit logic associated with at least
one node, and providing a link between a pair of nodes
according to the entry logic and the exit logic.

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51. The method of any of claims 40 to 50, comprising
the step of checking expected conformance with the DVD-
video format using the created components and transitions.

20 52. The method of any of claims 40 to 51, comprising
the step of checking expected conformance with the DVD-
video format using the set of AV assets and the expanded
data structure of nodes and links.

25 53. An authoring method for use in creating an
audiovisual product according to a DVD-video
specification, comprising the steps of:

generating a set of AV assets each comprising a video
30 object, zero or more audio objects and zero or more sub-
picture objects, and an expanded data structure of nodes
and links, where each node is associated with one AV asset

of the set and the links represent navigational movement from one node to another; and

creating a DVD-video format data structure from the
5 set of AV assets, using the nodes and links;

the method characterised by the steps of:

creating a plurality of components and a plurality of
10 transitions, where a component implicitly defines a plurality of AV assets by referring to a presentation template and to items of raw content substitutable in the presentation template, and the plurality of transitions represent navigational movements between components; and

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expanding the plurality of components and the plurality of transitions to generate the set of AV assets and the expanded data structure of nodes and links, wherein the set of AV assets and the expanded data
20 structure of nodes and links comprise data representing merged first and second video.

54. A method as claimed in any of claims 1 to 53 for
25 merging first and second data associated with first and second DVD-Video zone directories respectively; the method comprising the steps of: identifying the registers used by at least one of the first and second data; allocating use of the registers to at least one of the first and second
30 data according to said identifying; and creating data associated with video manager information (VMGI) of the

DVD-video disc image data to accommodate at least one of the first and second DVD-Video zones.

55. A method as claimed in claim 54 comprising the step of collating the first and second data to produce
5 DVD-Video data.

56. A method as claimed in any of claims 54 to 55, in which at least one of the first and second data comprises at least one of a Group of Pictures, a Video Object, a Video Object Set, a Video Object Unit, a Cell,
10 Program, Part_of_Title, Program Chain, Title, Navigation Pack, Video Pack, Audio Pack or DVD-Video disc image data.

57. A method as claimed in any of claims 54 to 56 in which the step of creating comprises the step of creating menu data of video manager menu data (video_ts.vob) to
15 access at least one of the first and second data.

58. A method as claimed in any of claims 54 to 57, further comprising the step of establishing a backup copy of the data associated with the video manager information.

59. A method as claimed in claim 58 in which the
20 step of establishing a backup copy of the data associated with the video manager information comprises the step of creating VMGI backup information (video_ts.bup).

60. A method as claimed in any of claims 54 to 59 in which the first and second data were created using
25 respective, different, authoring tools or by different authors using the same tool.

61. A method as claimed in any of claims 54 to 60, further comprising, prior to the step of identifying, the

step of determining whether or not at least one of the first and second data has associated copy protection.

62. A method as claimed in any of claim s 54 to 61 further comprising the step of creating the first data
5 using a respective authoring tool and performing the steps of any preceding claim using that respective authoring tool.

63. A method as claimed in any of claims 1 to 53 for merging first and second video data (VTSs); the method
10 comprising the steps of:

assessing potential use of a predeterminable resource by at least one of the first and second video data;

allocating use of the predeterminable resource to
15 at least one of the first and second video data according to the step of assessing;

collating the first and second video data to create DVD-Video data; and

creating data associated with video manager
20 information (VMGI) of the DVD-Video data to accommodate at least one of the first and second video data.

64. A data processing method as claimed in claim 63, in which the predeterminable resource is at least one of GPRM registers, titles and part titles.

25 65. A data processing method substantially as described herein with reference to and/or as illustrated in any of figures 15 to 18.

66. A data processing system comprising means to implement a method as claimed in any preceding claim.

67. A computer program comprising computer executable instructions for implementing a method or
5 system as claimed in any preceding claim.

68. A product comprising a storage medium storing a computer program as claimed in claim 67.

10 69. A storage medium storing an audiovisual product authored according to the method of any of claims 1 to 65.

70. An optical disk having stored thereon an audiovisual product authored according to the method of
15 any of claims 1 to 65.

71. An authoring method substantially as described herein with reference to and/or as illustrated in any of the accompanying drawings.

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